
Intestinal tapeworm

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➤ The four major tapeworms that cause noninvasive infections in humans are :-

- The beef tapeworm *Taenia saginata*.
- The pork tapeworm *Taenia solium*.
- The fish tapeworm *Diphyllobothrium Latum*.
✓ Each of which can reach many meters in length.
- The dwarf tapeworm *Hymenolepis nana*.

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- Taenia and Hymenolepis species are broadly distributed, especially in the tropics; D latum is most prevalent in temperate regions.
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- Humans acquire tapeworm by eating :-

- Under-cooked beef infected with the larval stage of T. saginata.
- Under-cooked pork containing the larval stage of T. solium or T. asiatica.
- Under-cooked freshwater fish containing larvae of D. latum.

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- Usually, only one adult tapeworm is present in the gut but up to 10 have been reported.
- The ova of all the three *Taenia* are indistinguishable microscopically.
- Examination of scolex and proglottids can differentiate them:
 - *T. solium* has a rostellum and two rows of hooklets on the scolex, and discharges multiple proglottids (3–5) attached together with lower degrees of uterine branching (~ 10).
 - *T. saginata* has only four suckers in its scolex, and discharges single proglottids with greater uterine branching (up to 30).
 - *T. asiatica* has a rostellum without hooks on its scolex and is difficult to differentiate from *T. saginata*, except that there are fewer uterine branches (16–21).

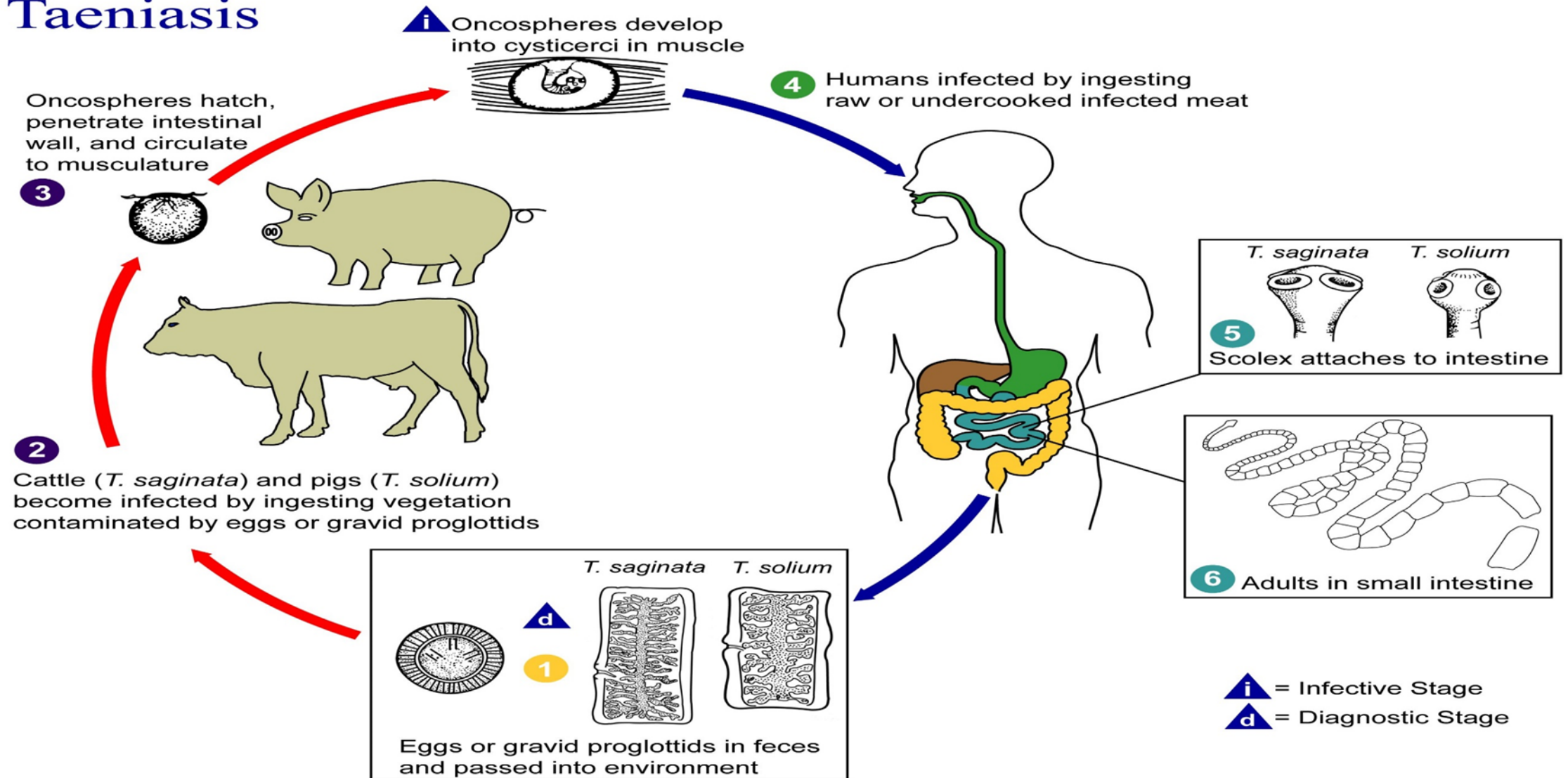
Intestinal tapeworm

❖ **Pork Tapeworm :- *Taenia solium***

- Common in central Europe, South Africa, South America and parts of Asia.
- Is not as large as *T. saginata*.
- *T solium* is transmitted to pigs that ingest human feces.
- Humans can be either the definitive host (after consuming undercooked pork, leading to tapeworm infection) or the intermediate host (after consuming food contaminated with human feces containing *T solium* eggs, leading to cysticercosis).
- The adult worm is found only in humans following the ingestion of pork containing cysticerci.
- Infection with *T solium* adult worms is generally asymptomatic, but gastrointestinal symptoms may occur.

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Taeniasis



Intestinal tapeworm

❖ Pork Tapeworm :- *Taenia solium*

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❖ **Pork Tapeworm :- *Taenia solium***

- Infection is generally recognized after passage of proglottids.
- Autoinfection with eggs can progress to cysticercosis.
- Intestinal infection is treated with praziquantel or nicodamid , both as a single dose.
- A single dose of praziquantel (5–10 mg/kg orally) is highly effective
- Alternative treatment with nitazoxanide.
- Followed by a mild laxative (after 1–2 hours) to prevent retrograde intestinal autoinfection.
- Cooking pork well prevents intestinal infection.
- Great care must be taken while attending a patient harboring an adult worm to avoid ingestion of ova or segments.

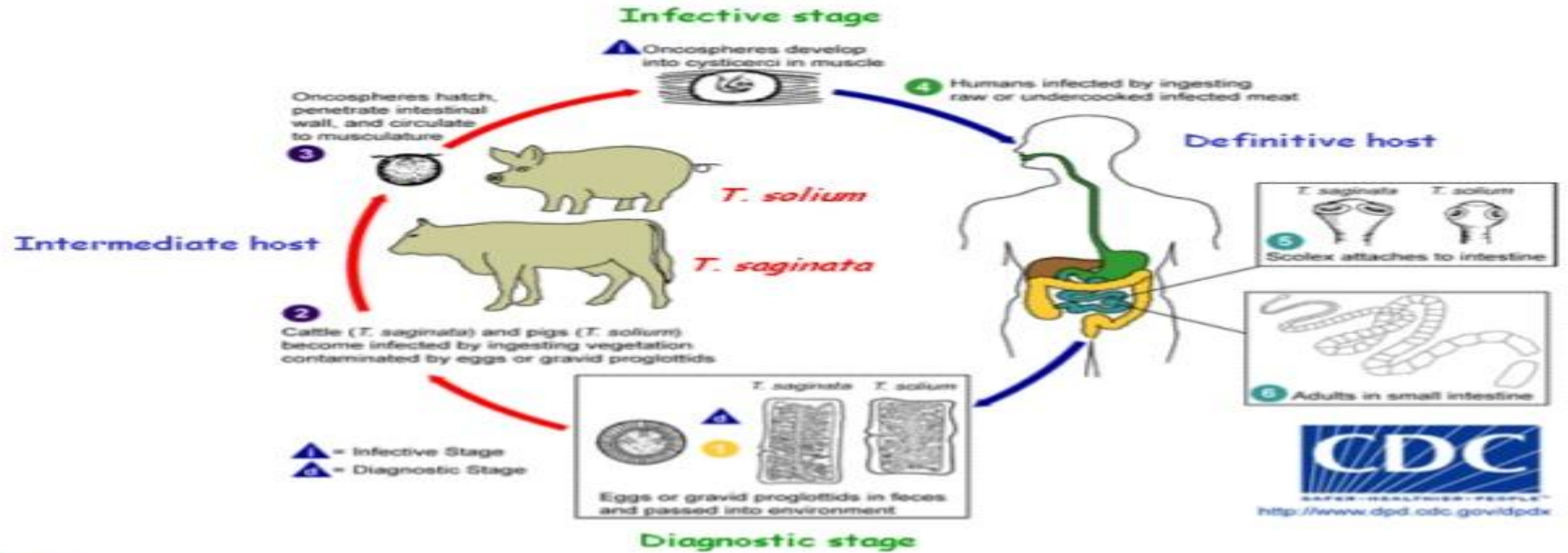
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❖ Beef Tapeworm :- *Taenia saginata*

- Infection with *T. saginata* occurs in all parts of the world.
- Humans are the definitive host.
- Gravid segments of *T saginata* are passed in human feces to soil, where they are ingested by grazing animals, especially cattle.
- The eggs then hatch to release embryos that encyst in muscle as cysticerci.
- Humans are infected by eating raw or undercooked infected beef.

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Beef Tapeworm *Taenia saginata*



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❖ Beef Tapeworm :- *Taenia saginata*

- The adult worm may be several meters long and produces little or no intestinal upset in human beings.
- Most individuals infected with *T saginata* are asymptomatic, but abdominal pain and other gastrointestinal symptoms may be present.
- Eosinophilia is common.
- Identification of segments in the faeces or on underclothing may distress the patient.
- Ova may be found in the stool.

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❖ Beef Tapeworm :- *Taenia saginata*

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- Praziquantel is the drug of choice. A single dose of praziquantel (5–10 mg/kg orally).
 - Alternative treatment with niclosamide or nitazoxanide .
 - Prevention depends on efficient meat inspection and the thorough cooking of beef.

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❖ Fish Tapeworm :- *Diphyllobothrium Latum*

- Infection with *D latum* follows ingestion of undercooked freshwater fish, most commonly in temperate regions.
- Eggs from human feces are taken up by crustaceans, these are eaten by fish, which are then infectious to humans.
- Infection with multiple worms over many years can occur.
- Infections are most commonly asymptomatic, but nonspecific gastrointestinal symptoms, including diarrhea, may occur.

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❖ Fish Tapeworm :- *Diphyllobothrium Latum*

➤ Diagnosis usually follows passage of proglottids.

➤ Prolonged heavy infection can lead to megaloblastic anemia and neuropathy from;-

✓ Vitamin B12 deficiency, which is due to infection-induced dissociation of the vitamin from intrinsic factor.

✓ Utilization of the vitamin by worms.

➤ Praziquantel is the drug of choice. A single dose of praziquantel (5–10 mg/kg orally).

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❖ Dwarf Tapeworm :- *Hymenolepis nana*

- *H nana* is the only tapeworm that can be transmitted between humans.
- Infections are common in warm areas, especially with poor hygiene and institutionalized populations.
- Infection follows ingestion of food contaminated with human feces. Eggs hatch in the intestines, where oncospheres penetrate the mucosa, encyst as cysticercoid larvae, and then rupture after about 4 days to release adult worms.
- Autoinfection can lead to amplification of infection.
- *H nana* are dwarf in size relative to other tapeworms but can reach 5 cm in length.

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❖ Dwarf Tapeworm :- *Hymenolepis nana*

❖ Clinical features

➤ Heavy infection is common, especially in children, and can be accompanied by abdominal discomfort, anorexia, and diarrhea.

❖ Diagnosis

➤ Diagnosis is usually made based on the identification of characteristic eggs or proglottids in stool.

➤ Egg release may be irregular, so examination of multiple specimens or concentration techniques may be needed.

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❖ Dwarf Tapeworm :- *Hymenolepis nana*

❖ Treatment

- The drug of choice for *H nana* infections is praziquantel.

- A single dose of praziquantel (25 mg/kg orally).
- Niclosamide is alternative therapy is continued daily for 1 week.
- Treatment of *H nana* is more difficult, as the drug is not effective against maturing cysts.
- Repeat treatment after 1 week and screening after therapy to document cure are appropriate with heavy infections.
- Therapy can be accompanied by headache, malaise, dizziness, abdominal pain, and nausea.

Thank you